

# Course Overview

CSC 209 Data Structures

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# What is this course about?

- **Data Structures**
  - How to organize data in your application so it can be *efficiently accessed and manipulated*?
  - How to implement commonly used data structures in Java?
  - How to use the Java Collection Frameworks (JCF)?
- **Analysis of Algorithms**
  - How to analyze code and predict how fast it will run and how much memory it will require?

# *Topics and Schedule*

Week #	Topic
1	Course overview, Review of Java: Class, Abstract Data Types (ADT), Java Collection Framework (JCF)
2	Review of Java: Interface, Generic Types
3	Analysis of Algorithms (Big-O notation, selection sort, insertion sort), NP-completeness and Undecidability
4	Linked Lists: Singly, Doubly, Circular
5	ArrayList, LinkedList, Vector
6	Stacks and Queues
7	Recursion: Numerical Applications
	<b>Midterm exam</b>
8	Recursion: Tail Recursion, Backtracking
9	Binary Tree, Tree Traversal
10	Sorting (divide-and-conquer): Mergesort, Quicksort
11	Sorting: Binary heap and heapsort
12	Map ADT, Hashing, HashMap, TreeMap
13	Binary Search Tree
14	Graph data structures, Graph traversal
15	Crawling Wikipedia
16	Information retrieval and Boolean search
	<b>Final exam</b>

# Grading

- Midterm Exam 30%
- Final Exam 40%
- Programming assignments 30%

# Course Materials

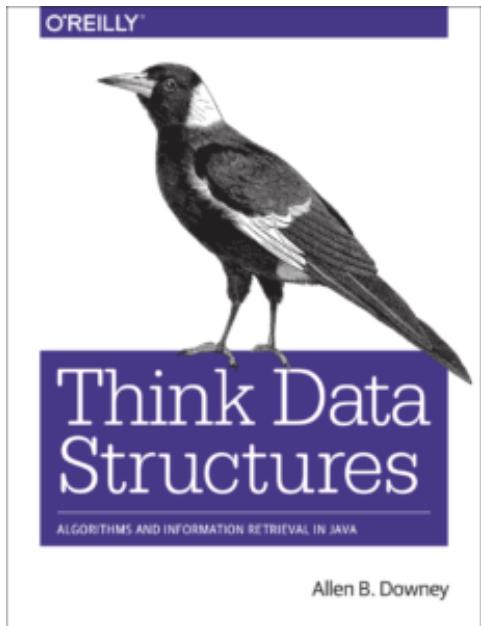
- Lecture Slides:

<https://learning.sit.kmutt.ac.th/#/subjects/221>

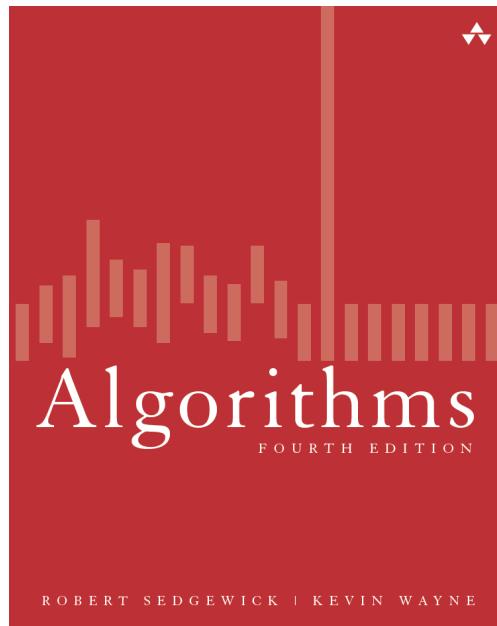
- Example programs:

[https://github.com/kulwadeesom/csc209\\_256002](https://github.com/kulwadeesom/csc209_256002)

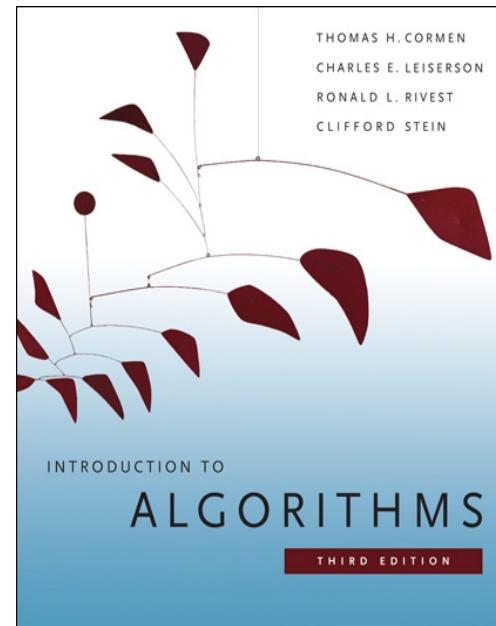
# Recommended Textbooks



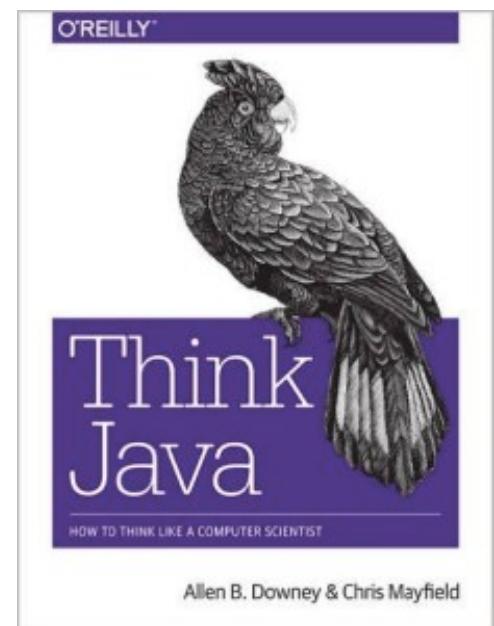
<http://greenteapress.com/wp/think-data-structures/>



<https://algs4.cs.princeton.edu/home/>



<https://mitpress.mit.edu/books/introduction-algorithms>



<http://greenteapress.com/wp/think-java/>

# Obtaining example programs from GitHub

[https://github.com/kulwadeesom/csc209\\_256002](https://github.com/kulwadeesom/csc209_256002)

kulwadeesom / **csc209\_256002**

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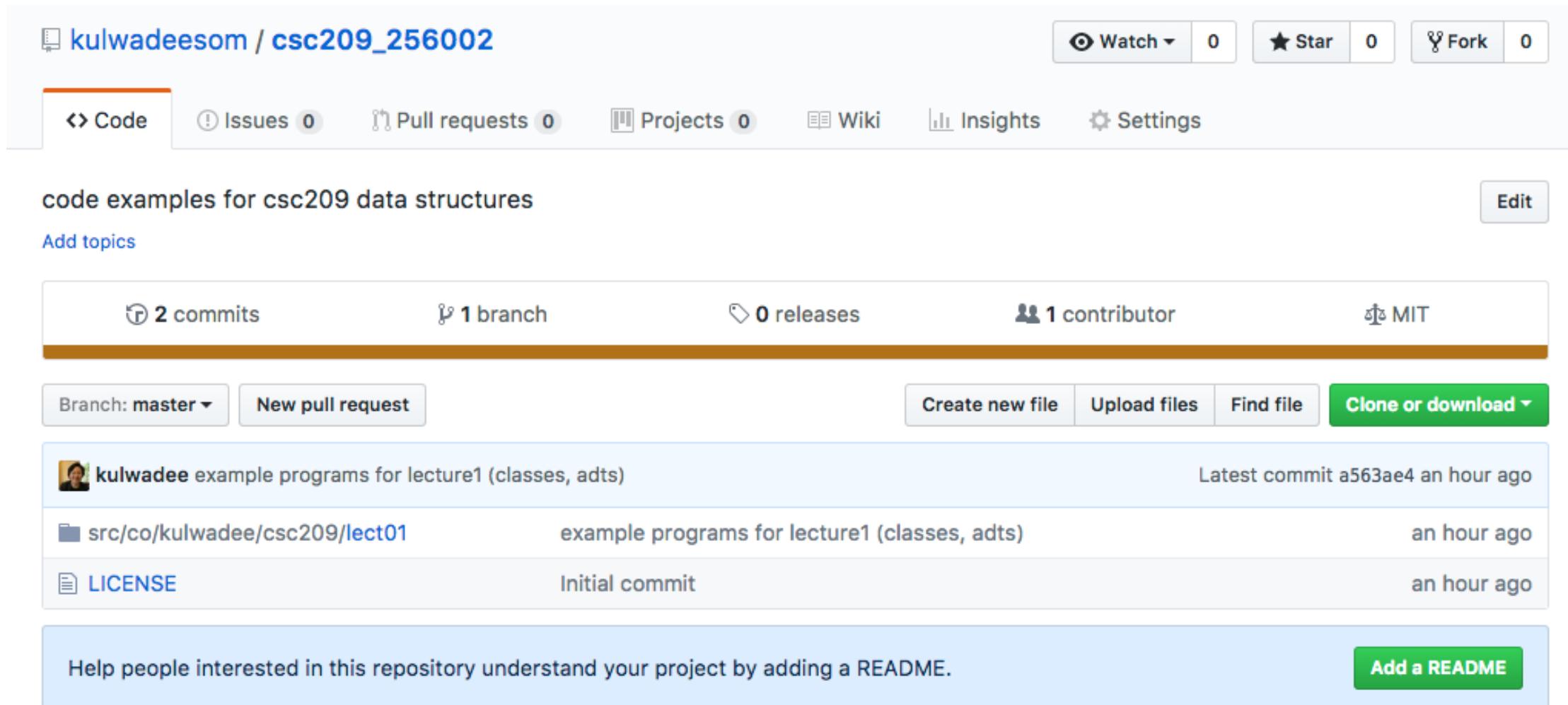
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 **kulwadee** example programs for lecture1 (classes, adts) Latest commit a563ae4 an hour ago

 [src/co/kulwadee/csc209/lect01](#) example programs for lecture1 (classes, adts) an hour ago

 [LICENSE](#) Initial commit an hour ago

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# Obtaining example programs from GitHub

1. Open the 'Git' perspective in Eclipse.

Window → Perspective → Open Perspective → Other... → select Git

2. Copy the Git repo URI to Clipboard: [https://github.com/kulwadeesom/csc209\\_256002.git](https://github.com/kulwadeesom/csc209_256002.git)
3. Inside Eclipse, right-click on the 'Git Repositories' pane.
4. Click Next two times, and select a destination directory (DESTDIR) on your local machine.
5. Click Finish.
6. Switch to 'Java' perspective.
7. Create New Java Project from the source code in the DESTDIR.